REMARKS

I. Introduction

Claims 22-37 stand rejected. Claims 29 and 30 have been amended. The amendment is supported by the original disclosure and does not add new matter. The amendment of claim 30 is not meant to change claim scope, but rather merely to improve clarity.

Please reconsider the present application in light of the amendment and the following remarks.

II. Rejection of Claims 25, 27 and 35 under 35 U.S.C § 112

Claim 25, 27 and 35 stand rejected under 35 U.S.C § 112, ¶1.

Regarding claim 25, the Office Action objects to the "beam expander". Applicant respectfully submits that this feature is described in the original disclosure at at least page 37-ln.21, page 46-ln 20 and in claims 21, 22, 23 of the originally filed application.

Regarding claims 27 and 35, the Office Action objects to the "M^2 parameter close to unity". Applicant respectfully submits that this feature is inherent in the types of lasers disclosed in the application.

For the above reasons, withdrawal of the section 112 rejections is respectfully requested.

III. Rejection of Claims 22-26 under 35 U.S.C. § 102(b)

Claims 22-26 stand rejected under 35 U.S.C. 102(b) over 4,862,257 ("Ulitch"). Applicant respectfully submits that Ulitch does not anticipate Applicant's claim 22. Claim 22 recites:

> A system for imaging **the sea bottom** from a submerged position, comprising:
> a source of pulsed light configured to emit a two-dimensional beam of pulsed light;

> an aiming/directing device configured to direct the two-dimensional beam of pulsed light towards the sea bottom;
>
> a solid-state detector having an internal two-dimensional array of individual photosensitive detectors configured to generate electric current signals representing a two-dimensional video image from the two-dimensional beam of reflected pulsed light; and
>
> an image intensifier tube having active gating control of a photocathode bias voltage, the photocathode bias voltage configured to control the optical gain of the image intensifier tube and to selectively intensify or block the beam of reflected pulsed light to avoid the entrance of backscattered light, the control being based at least in part on a known time needed for the beam of pulsed light to travel to and from the sea bottom.

Ulitch generally describes visualizing submerged objects by capturing two images, one of them "the shadow image" which originates from illumination of the sea bottom cannot be created as no light penetrates beyond the sea bottom to create a "shadow" image of the sea-bottom. Ulitch' technique is therefore restricted to image objects which are strictly above the sea bottom, as no shadow image can be created from the sea bottom from the sea bottom itself...

Contrary to what is asserted the Office Action, for example on page 3, Ulitch' Fig. 1 clearly shows a submerged object or target located away from the sea bottom. Further, the sea bottom is not even labeled in Fig. 1, because it is not what is imaged. Ulitch also does not teach or suggest an **aiming/directing device configured to direct the two-dimensional beam of pulsed light towards the sea bottom**, rather, the Ulitch system is expressly configured to direct the beam at the object being imaged that is **above** the sea floor.

Ulitch fails to describe how to specifically image the sea-bottom surface. Ulitch technique cannot be used for imaging the sea-bottom itself. Moreover, it would not be clear to anyone skilled in the art how to modify Ulitch technique to allow for imaging the surface of the sea bottom. Rather, Ulitch directs pulsed light "at an object enveloped by the medium" (the water) – not the bottom of the sea. Ulitch 9:47-49.

Claims 23-26 depend from claim 22 and should therefore be allowable for at least the same reasons. Moreover, the same argument applies with even greater weight to claim 23, which recites:

> a synchronization electronic device configured to control the image intensifier tube to allow only the entrance of light **reflected from the sea bottom**; and

> a signal processing device configured to process the electric current signals received from the detector and to produce an image signal **representing the sea bottom**.

As discussed above, Ulritch does not have the recited signal processing device because it does not produce an image signal representing **the sea bottom**. Ulritch' technique, which relies on a shadow image, cannot be used to image the sea bottom.

For at least the above reasons, claims 22-26 are not anticipated by Ulritch and should be allowed.

IV. Rejection of Claims 30-33 and 36-37 under 35 U.S.C. § 102(b)

Claims 30-33 and 36-37 stand rejected under 35 U.S.C. 102(b) over U.S. Patent 5,418,608 ("Caimi"). Applicant respectfully disagrees because Caimi does not teach or suggest all the features of claim 30. Claim 30 recites:

> 30. (New) A system for imaging the sea bottom from a submerged position, comprising:
>
> a source of pulsed light configured to emit a concentrated beam of pulsed light illuminating a single point;
>
> an aiming/directing device configured to perform a two-dimensional scan of a portion of the sea bottom with the concentrated beam of pulse light from a single location;
>
> **a single photodetector configured to generate a sequence of current pulses with temporal characteristics similar to temporal characteristics of a reflected pulsed light generated by the two dimensional scan;**
>
> an image intensifier tube having active gating control of a photocathode bias voltage, the photocathode bias voltage configured to control the optical gain of the image intensifier tube and to selectively intensify or block the beam of reflected pulsed light to avoid the entrance of backscattered light, the control being based at least in part on a known time needed for the beam of pulsed light to travel to and from the sea bottom.

Claim 30 recites "a single photodetector configured to generate a sequence of current pulses with temporal characteristics similar to temporal characteristics of a reflected pulsed light generated by the two dimensional scan". The Office Action cites integrate sensor current, col. 10, line 13-14 for the generation of the sequence of current pulses. However, the process of integration of a

signal current wipes out its temporal pulse characteristics. Accordingly, Applicant respectfully submits that the cited feature of Caimi, the integrator, cannot generate the sequence of current pulses with temporal characteristics... Accordingly, the cited Caimi reference does not anticipate Applicant's claim 30.

Claims 30-33 and 36-26 depend from claim 30 and therefore should be allowable for at least the same reasons as claim 30.

V. Rejection of Claims 28-29 under 35 U.S.C. § 103(a)

Claims 28-29 stand rejected under 35 U.S.C. 103(a) over U.S. Patent 5,418,608 ("Caimi") in view of a non-patent Harris reference.. These claims depend from claims 23, and should therefore be allowable for at least the same reasons. Moreover, Applicant respectfully disagrees with the rejection for at least the following additional reason. The Office Action says that electron bombardment of the array of individual photosensitive detectors in inherent in Ulitch. However, Applicant respectfully submits that most uses of photosensitive detectors are used to respond to photon bombardments, not electronic bombardments. The photosensitive detectors in Harris are also excited with photons.

VI. Rejection of Claim 34 under 35 U.S.C. § 103(a)

Claim 34 stand rejected under 35 U.S.C. 103(a) over U.S. Patent 5,418,608 ("Caimi") in view of Schmitschek (U.S. Patent 4,229,711). Claim 34 depends from claim 33 and should therefore be allowable for at least the same reasons as its parent claim.

CONCLUSION

In view of the foregoing remarks, it is respectfully submitted that all pending claims of the present application are now in condition for allowance. Prompt reconsideration and allowance of the present application are therefore earnestly solicited.

While no additional fee is believed to be due, the Office is hereby authorized to charge any additional fees, which may arise out of the filing of this paper, or credit any overpayments to the deposit account of **K&L Gates LLP,** Deposit Account No. **080570**.

Respectfully submitted,

Date: August 23, 2010

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